UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,164	04/07/2004	Michael Bourgoin	07844-647001/P600	1268

21876 7590 02/09/2009

FISH & RICHARDSON P.C.
P.O. Box 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
GUERTIN, AARON M	
ART UNIT	**PAPER NUMBER**
2628	

NOTIFICATION DATE	DELIVERY MODE
02/09/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

Office Action Summary	Application No.	Applicant(s)	
	10/821,164	BOURGOIN ET AL.	
	Examiner	**Art Unit**	
	AARON M. GUERTIN	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 October 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *37-41* is/are allowed.

6)☒ Claim(s) *1-10,13,14,17-28,31,32,35,36 and 42-47* is/are rejected.

7)☒ Claim(s) *11,12,15,16,29,30,33 and 34* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

- Claims 1-47 are presented for examination.

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 1-10, 13, 14, and 17-19 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

3. Claim(s) 1 is rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. Supreme Court precedent[1] and recent Federal Circuit decisions[2] indicate that a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. For example, the method steps of generating, processing, and outputting do

---

[1] *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

[2] *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

not positively recite a particular machine or apparatus to which is tied and such steps can be performed manually without the use of a structure.

[1] *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).
[2] *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-3, 5-9, 13, 17-21, 23-27, 31, 36, 36, and 42-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,462,748 (Fushiki) in view of U.S. Publication No.: US 2002/0031256 A1 (Hiramatsu), in further view of U.S. Publication No.: US 2002/0083859 A1 (Hauck).

6. Regarding claim 1, Fushiki teaches of a machine-implemented method ([Column 1, lines 12-15] - *relates generally to computer graphics, and more particularly to the use of a computer to perform various color processing operations… on a color object.*) comprising: **a color profile** ([Fig. 4, (124, 126, and 128)] and [Column 8, lines 9-34] - *the ICC profile 124 of the sRGB space can be used together with the ICC profile 122 of the input device to convert the color data 120 to the sRGB color space 100 to form the color object 70… the color data 126 or 128 are used to create a color object in the*

respective color space…) **that conforms to a defined color profile architecture** ([Fig. 4, (122)] and [Column 8, lines 9-34] - *the ICC profile 124 of the sRGB space can be used together with the ICC profile 122 of the input device to convert the color data 120 to the sRGB color space 100 to form the color object 70…*); **and that defines a multistage transform** ([Fig. 3, (70a-70e)] and [Column 6, lines 47-65] - *By way of example, FIG. 3 illustrates an exemplary sequence of color processing operations…*); **capable of translating a first color space** ([Fig. 4, (100)]) **to a second color space** ([Fig. 4, (102)]); **processing an image** (executing the transform) **using the color profile** ([Fig. 4, (124, 126, and 128)] and [Column 8, lines 9-34] - *the ICC profile 124 of the sRGB space can be used together with the ICC profile 122 of the input device to convert the color data 120 to the sRGB color space 100 to form the color object 70… the color data 126 or 128 are used to create a color object in the respective color space…*)**; and outputting the image** ([Fig. 4, (96)] and [Column 2, lines 60-65 - *Input and output color conversions may be performed to interface with input and output devices that use different color spaces…*). Fushiki further teaches wherein **one of the first and second color spaces is the image color space** ([Fig. 4, (100)]) **and the other of the first and second color spaces is a profile connection space** ([Fig. 4, (102)]) and **affecting two stages of the multistage transform** ([Fig. 3, (70a-70e)] and [Column 6, lines 3-25] - *Optimal quality of color processing is achieved by selectively performing a color processing operation in the more suitable one of the two color space…* [Column 6, lines 46-65] - *Two perceptual-based operations, gamut mapping*

and saturation adjustments, are performed on the color object 70 by corresponding operation modules 110 (FIG. 2) of the graphics engine…).

Fushiki teaches the limitations of claim 1 above, however, Fushiki fails to specifically teach of wherein an image comprises **a parameterized encoding of an image color space with image parameters defining a range and an offset of an image component of the image, and a white point of the image color space;** and comprises **affecting the multistage transform based on the image parameters**.

Hiramatsu teaches of a machine-implemented method ([0002] - *The present invention relates to a color matching method, a color matching device, a color matching program, and a computer readable record medium that stores the color matching program… which are used for converting digital image data reproducible by a device such as a CRT…*); wherein a image comprises **a parameterized encoding of an image color space** ([0082] and [0083] - *data of a white point and a black point of the input color space and data of a white point and a black point of the output color space are obtained… (conversion parameter) is set based on each white point data obtained… a color space compression parameter is derived for appropriately converting data within the input color space into data within output color space…*) **with image parameters defining a range** ([0025] - *image data within the color reproduction range of the first device is converted using a conversion parameter into image data within the color reproduction range of the second device…*) **and an offset of an image component of the image** ([0085] - *the color space compression processing on the absolute color space is performed… of the input image data as the target of conversion.*

Specifically, four conversion processes are performed including correction of a white point, compression (including expansion; the same applies below) in the direction of chroma, correction of hue, and compression in the direction of lightness…) (offsets exist in the correction of components)**, and a white point of the image color space** ([0082] and [0083] - *data of a white point and a black point of the input color space and data of a white point and a black point of the output color space are obtained… (conversion parameter) is set based on each white point data obtained…*). Hiramatsu also teaches of wherein a color profile comprises **affecting the multistage transform based on the image parameters** ([Fig. 4, (s411)] and [0096] - *the color space compression processing on the absolute color space is performed and output data represented in the L*a*b* space is obtained, in step S411, the output data is converted into data represented in a color space dependent on the output device…*).

Hiramatsu further teaches the benefits of using conversion parameters when color matching and processing, and how by taking image characteristics with respect to color spaces and using said characteristics during processing, that higher computation processing speeds can be achieved ([0024] - *allow an appropriate color matching that takes into account characteristics of the input color space and the output color space to be performed at high speed…* [0027] - *conversion parameter is determined based on the respective data related to the specific color of the first device and the second device… In addition, higher computation processing speed for parameter determination can be achieved when compared to the case in which the conversion parameter is determined based on numerous color data…*).

All of the elements of claim 1, are known in Fushiki in view of Hiramatsu, the only difference is the combination of know elements into a single system and method.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to include in Fushiki the image conversion parameters taught by Hiramatsu, as the benefits of using conversion parameters when color matching and processing reduce computation time with pre processing and increased computation processing speeds within color generation.

Fushiki and Hiramatsu teach the limitations of claim 1 above, however, Fushiki and Hiramatsu fail to specifically teach that the **color profile is generated**.

Hauck is analogous art that further teaches of **generating a color profile** ([0010] - *The present invention provides a method for generating a color profile…*).

All the elements of claim 1 are known in Fushiki and Hiramatsu in view of Hauck, the only difference is the combination of known elements into a single system and method.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to include generating a color profile in Fushiki as doing so would provide the means for custom image generation that is flexible for a plurality of input and output devices, and avoiding color restrictions based on device or material.

7. Regarding claim 2, Fushiki, Hiramatsu, and Hauck teach the limitations of claim 1 above, the rationale disclosed in the rejection incorporated herein, and Hiramatsu further teaches of the color profile further comprises **increasing image processing**

precision by fitting output to input data scopes based on the parameterized encoding of the image ([0027] - *the precision of color matching improves when compared to the case in which the color matching is performed using a pre-fixed conversion parameter. In addition, higher computation processing speed for parameter determination can be achieved when compared to the case in which the conversion parameter is determined based on numerous color data…* and [0028] - *Therefore, it becomes possible to provide a color matching method that allows appropriate color matching that takes into account the characteristics of the input color space and the output color space to be performed at a higher speed.*).

Fushiki further teaches of fitting the processing **between the two stages of the multistage transform** ([Fig. 3, (70a-70e)] and [Column 6, lines 3-25] - *Optimal quality of color processing is achieved by selectively performing a color processing operation in the more suitable one of the two color space…* [Column 6, lines 46-65] - *Two perceptual-based operations, gamut mapping and saturation adjustments, are performed on the color object 70 by corresponding operation modules 110 (FIG. 2) of the graphics engine…*).

8. Regarding claim 3, Fushiki, Hiramatsu, and Hauck teach the limitations of claims 1 and 2 above, the rationale disclosed in the rejection incorporated herein, and Fushiki further teaches of further comprising **affecting three stages** ([Fig. 3, (70a-70e)] and [Column 6, lines 3-25] - *FIG. 3 illustrates an exemplary sequence of color processing operations… Two perceptual-based operations, gamut mapping and saturation*

adjustments, are performed… The next color processing operation is alpha-masking, and the graphics engine 72 determines that this operation should be performed in the physical-based color space 102…), **which include the two stages, of the multistage transform such that the color profile effects chromatic adaptation** ([Fig. 3, (70a-70e)] and [Column 6, lines 3-25] - *Optimal quality of color processing is achieved by selectively performing a color processing operation in the more suitable one of the two color space…* [Column 6, lines 46-65] - *Two perceptual-based operations, gamut mapping and saturation adjustments, are performed on the color object 70 by corresponding operation modules 110 (FIG. 2) of the graphics engine…*).

Hiramatsu further teaches of the color profile **chromatic adaptation according to the white point** ([0082] and [0083] - *data of a white point and a black point of the input color space and data of a white point and a black point of the output color space are obtained… (conversion parameter) is set based on each white point data obtained…*), **transcodes the image component according to the range and the offset** ([0025] - *image data within the color reproduction range of the first device is converted using a conversion parameter into image data within the color reproduction range of the second device…* [0085] - *the color space compression processing on the absolute color space is performed… of the input image data as the target of conversion. Specifically, four conversion processes are performed including correction of a white point, compression (including expansion; the same applies below) in the direction of chroma, correction of hue, and compression in the direction of lightness…*) (offsets exist in the correction of components); and the fitting comprises **fitting output to input data**

scopes ([0027] - *higher computation processing speed for parameter determination can be achieved when compared to the case in which the conversion parameter is determined based on numerous color data…* and [0028] - *Therefore, it becomes possible to provide a color matching method that allows appropriate color matching that takes into account the characteristics of the input color space and the output color space to be performed at a higher speed.*).

Fushiki further teaches of fitting the processing output to input data **among the stages** ([Fig. 3, (70a-70e)] and [Column 2, lines 60-65] - *Input and output color conversions may be performed to interface with input and output devices that use different color spaces.* [Column 6, lines 3-25] - *Optimal quality of color processing is achieved by selectively performing a color processing operation in the more suitable one of the two color space…* [Column 6, lines 46-65] - *Two perceptual-based operations, gamut mapping and saturation adjustments, are performed on the color object 70 by corresponding operation modules 110 (FIG. 2) of the graphics engine…*).

9. Regarding claim 5, Fushiki, Hiramatsu, and Hauck teach the limitations of claims 1 and 2 above, the rationale disclosed in the rejection incorporated herein, and Hiramatsu further teaches of wherein **taking into account at least a portion of the image parameters** ([0082] and [0083] - *data of a white point and a black point of the input color space and data of a white point and a black point of the output color space are obtained… (conversion parameter) is set based on each white point data obtained… a color space compression parameter is derived for appropriately converting*

data within the input color space into data within output color space…). Fushiki teaches further of **within a stage of a transform-defining element of the defined color profile architecture** ([Fig. 3, (70a-70e)], [Fig. 4, (122)] and [Column 6, lines 47-65] - *By way of example, FIG. 3 illustrates an exemplary sequence of color processing operations…* [Column 8, lines 9-34] - *the ICC profile 124 of the sRGB space can be used together with the ICC profile 122 of the input device to convert the color data 120 to the sRGB color space 100 to form the color object 70…*); the transform-defining element comprising **at least three stages and at most five stages** ([Fig. 3, (70a-70e)]).

10. Regarding claim 6, Fushiki, Hiramatsu, and Hauck teach the limitations of claim 1, 2, and 5 above, the rationale disclosed in the rejection incorporated herein, and Hiramatsu further teaches of wherein the image color space comprises **a CIELAB color space,** and the profile connection space comprises **a CIEXYZ color space** ([0100] - *The L*a*b* data of the white point and the black point of the input color space is derived… from a profile of the input color space… profile of each color space is data represented in a color space other than the L*a*b* space, such as data represented in the XYZ (Yxy) space… defined by CIE (International Commission on Illumination)*).

11. Regarding claim 7, Fushiki, Hiramatsu, and Hauck teach the limitations of claim 1, 2, 5, and 6 above, the rationale disclosed in the rejection incorporated herein, Fushiki further teaches of wherein the image color space comprises teaches of wherein the

defined color profile architecture comprises **an International Color Consortium color profile architecture** ([Fig. 4, (122)] and [Column 8, lines 9-34] - *the ICC profile 124 of the sRGB space can be used together with the ICC profile 122 of the input device to convert the color data 120 to the sRGB color space 100 to form the color object 70…*),and Hiramatsu further teaches of wherein the transform - defining element (correction parameter) comprises **a lutAtoB tag** ([0100] - *L*a*b* data of the white point and the black point of the input color space is derived by performing color conversion on a value corresponding to the color white… and a value corresponding to the color black…* and [0116] - *In this case, the white point correction parameter is derived from the ab-value (a, b) of the white point in the input color space as an amount of movement (-a, -b) of the white point and an amount of movement (0, 0) of the black point*).

12. Regarding claim 8, Fushiki, Hiramatsu, and Hauck teach the limitations of claim 1 above, and the rationale disclosed in the rejection incorporated herein, Hiramatsu further teaches of **wherein the first color space is the image color space and the second color space is the profile connection space** ([0100] - *The L*a*b* data of the white point and the black point of the input color space is derived by performing color conversion on a value corresponding to the color white… and a value corresponding to the color black… from a profile of the input color space… the profile of each color space is data represented in a color space other than the L*a*b* space, such as data represented in the XYZ (Yxy) space, it is converted as required into L*a*b* data using a transformation expression or the like defined by CIE (International Commission on*

Illumination).), the method further comprising **receiving the image** ([0084] - *When the color space compression parameter is set, in step S405, a pixel value (image data) of an input image to be the target of data conversion is obtained…*).

13. Regarding claim 9, Fushiki, Hiramatsu, and Hauck teach the limitations of claims 1-3 above, the rationale disclosed in the rejection incorporated herein, and Fushiki further teaches of wherein the affecting the two stages comprises: **determining a first processing stage of a transform-defining element of the defined color profile architecture** ([Fig. 4, (122)]); **determining a second processing stage of the transform-defining element** ([Fig. 3, (70a-70e)] and [Column 6, lines 3-25] - *Optimal quality of color processing is achieved by selectively performing a color processing operation in the more suitable one of the two color space…* [Column 6, lines 46-65] - *Two perceptual-based operations, gamut mapping and saturation adjustments, are performed on the color object 70 by corresponding operation modules 110 (FIG. 2) of the graphics engine…*), **and determining a third processing stage of the transform-defining element** ([Column 6, lines 46-65] - *The next color processing operation is alpha-masking, and the graphics engine 72 determines that this operation should be performed in the physical-based color space 102…gamut mapping and saturation adjustments, are performed on the color object 70 by corresponding operation modules 110 (FIG. 2) of the graphics engine…*); **wherein the first processing stage accounts** for color adjustments ([Fig. 3, (70a)] and [Column 6, lines 46-65] - *gamut mapping and saturation adjustments, are performed on the color object 70 by corresponding*

operation modules 110 (FIG. 2) of the graphics engine…); **wherein the second processing stage defines at least a portion of a conversion of the image color space to a chromatic adaptation color space** ([Fig. 3] - as the conversion conducts from 70a to 70b (second processing stage) the conversion adapts the image perceptual based color space (100) to the chromatic physical based color space (102))**.**

Hiramatsu further teaches wherein transformation stages comprise of several steps. The first step is shown in Fig.4, (S401-S403) wherein the color profile architecture is correlated and **accounts for the range and the offset** (defined in claim 1 as parameters) ([Fig. 4, (S403)])**.** Hiramatsu has a second transformation step including a conversion (Fig. 4, (S407)), and furthermore Hiramatsu teaches of **wherein the third processing stage defines a chromatic adaptation in the chromatic adaptation color space according to the white point** ([Fig. 4, (S409)] and [0085] - *Thereafter, in step S409, the color space compression processing on the absolute color space is performed…. Specifically, four conversion processes are performed including correction of a white point…*).

14. Regarding claim 13, the rationale disclosed in the rejection of claim 9 is incorporated herein.

15. Regarding claim 17, Fushiki, Hiramatsu, and Hauck teach the limitations of claim 1 above, and the rationale disclosed in the rejection incorporated herein, Fushiki further teaches of comprising **embedding the color profile in the image** ([Column 8, lines 9-

26] - *In the case the input device supports the ICC standard, the color data 120 provided by the input device will have attached thereto a device color profile 122… the ICC profile 124 of the sRGB space can be used together with the ICC profile 122 of the input device to convert the color data 120 to the sRGB color space 100 to form the color object 70*), and the outputting the image comprises **saving the image to a storage device** ([Column 5, lines 60-67] through [Column 6, lines 1-3] - *The processed color object may be stored on a storage device 92, such as a hard disk or recordable digital video disk, etc…*).

16. Regarding claim 18, Fushiki, Hiramatsu, and Hauck teach the limitations of claim 1 above, and the rationale disclosed in the rejection incorporated herein, Fushiki further teaches of wherein the processing the image using the color profile comprises **transforming the image from the image color space to a working color space** ([Column 2, lines 37-65] - *The graphics engine of the system includes a module for converting a color object from the perceptual-base color space to the physical-based color space and from the physical-based color space to the perceptual-based color space…*), and the outputting the image comprises **saving the image to a memory** ([Column 5, lines 60-67] through [Column 6, lines 1-3] - *The processed color object may be stored on a storage device 92, such as a hard disk or recordable digital video disk, etc…*).

17. Regarding claim 19, it is similar in scope to claim 1 (the rationale disclose in the rejection incorporated herein). However claim 19 further includes the limitation of **a storage device machine readable medium having a software product tangibly embodied therein, the software product comprising instructions operable to cause one or more data processing apparatus to perform operations**.

Fushiki further teaches of **a storage device machine readable medium having a software product tangibly embodied therein, the software product comprising instructions operable to cause one or more data processing apparatus to perform operations** ([Column 3, lines 32-51] - *as being implemented in a suitable computing environment. Although not required, the invention will be described in the general context of computer-executable instructions, such as program modules, being executed by a personal computer… program modules may be located in both local and remote memory storage devices*…).

Therefore claim 19 is rejected under the same rationale as claim 1 and in further view of the rationale provided by Fushiki - ([Column 3, lines 32-51]).

18. Regarding claims 20, 21, 23-27, 31, 35, and 36 they are similar in scope to claims 2, 3, 5-9, 13, 17, and 18 respectively. Said claims are different only in that they disclose a storage device machine readable medium. Fushiki teaches of a storage device machine readable medium within [Column 3, lines 32-51] (as further disclosed in the rationale provided in claim 19 above).

Therefore, claims 20, 21, 23-27, 31, 35, and 36 are rejected under the same rational as claims 2, 3, 5-9, 13, 17, and 18 and in further view of the rationale provided by Fushiki [Column 3 lines 32-51] as claim 19 above.

19. Regarding claim 42, the rationale disclosed in the rejection of claims 1 and 2 are incorporated herein.

20. Regarding claim 43, the rationale disclosed in the rejection of claims 1, 2, and 3 are incorporated herein.

21. Regarding claims 44 and 45, they are similar in scope to claims 42 and 43 respectively. Said claims are different only in that they disclose a storage device machine readable medium having a software product tangibly embodied therein, the software product comprising instructions operable to cause one or more data processing apparatus to perform operations. Fushiki teaches of a storage device machine readable medium within [Column 3, lines 32-51] (as further disclosed in the rationale provided in claim 19 above).

Therefore, claims 44 and 45 are rejected under the same rational as claims 42 and 43 and in further view of the rationale provided by Fushiki [Column 3 lines 32-51] as claim 19 above.

22. Regarding claim 46, the rationale disclosed in the rejection of claims 1, 2, and 3 are incorporated herein.

23. Regarding claim 47, the rationale disclosed in the rejection of claims 1, 2, 3, and 5 are incorporated herein.

24. Claim 4, 10, 14, 22, 28, 32, and 37-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,462,748 (Fushiki) U.S. Publication No.: US 2002/0031256 A1 (Hiramatsu) and U.S. Publication No.: US 2002/0083859 (Hauck) in view of U.S. Publication US 2003/0142222 A1 (Hordley).

25. Regarding claim 4, Fushiki, Hiramatsu, and Hauck teach the limitations of claims 1-3 above, the rationale disclosed in the rejection incorporated herein, and Hiramatsu further teaches of wherein **the image parameters of the parameterized encoding define ranges, offsets** ([0082] and [0083] - *data of a white point and a black point of the input color space and data of a white point and a black point of the output color space are obtained… (conversion parameter) is set based on each white point data obtained… a color space compression parameter is derived for appropriately converting data within the input color space into data within output color space…* [0025] - *image data within the color reproduction range of the first device is converted using a*

conversion parameter into image data within the color reproduction range of the second device…[0085] - *the color space compression processing on the absolute color space is performed… of the input image data as the target of conversion. Specifically, four conversion processes are performed including correction of a white point, compression (including expansion; the same applies below) in the direction of chroma, correction of hue, and compression in the direction of lightness…*) (offsets exist in the correction of components).

Fushiki, Hiramatsu, and Hauck teach the limitations of claims 1-3 above, however Fushiki, Hiramatsu, and Hauck fail to teach of wherein image parameters include **bit depths of image components of the image**, and the color profile comprises **a bit-depth independent color profile**.

Hordley teaches of a machine-implemented method ([0051] - *The colour signal to be processed may be obtained from a camera, a multispectral imaging device, or a scanner, or may be a computer generated RGB etc. signal.*) wherein image parameters include **bit depths** (color depth) **of image components of the image**, and the color profile comprises **a bit-depth independent color profile** ([0096] - *Variation of the magnitude of the illumination colour temperature vector produces a variation in depth of colour but does not alter the nature of the colour. Thus the colour warmness or colour depth can be increased or decreased by altering the magnitude of the illumination colour temperature…*). Hordley further teaches the benefits of using a modification based on bit or color depth and wherein the manipulation of the bit or color depth parameter causes enhancement of a final image without altering the illumination or the

original object producing the image ([0098] - *the illumination intensity vector can be increased or decreased so as to brighten or darken the overall picture. This allows enhancement of a final image without altering the illumination or the original object producing the image*).

All of the elements of claim 4, are known in Fushiki, Hiramatsu, and Hauck in view of Hordley, the only difference is the combination of know elements into a single system and method.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to include in Fushiki, Hiramatsu, and Hauck the image conversion parameter of bit or color depths taught by Hordley, as the benefits of using conversion parameters when color matching and processing, as adjustments to the bit or color depth are independent of the color profile therefore an enhancement of a final image without altering the illumination or the original object producing the image can be made (Hordley - [0098]).

26. Regarding claim 10, Fushiki and Hiramatsu teach the limitations of claims 1, 8, and 9 above, and the rationale disclosed in the rejection incorporated herein, Fushiki further teaches of wherein the transform-defining element comprises **five processing 'stages** ([Fig. 3, (70a-70e)]), and the first, second and third processing stages comprise **interior stages** (using ICC) ([Fig. 4, (122)] and [Column 8, lines 9-34] - *the ICC profile 124 of the sRGB space can be used together with the ICC profile 122 of the input*

device to convert the color data 120 to the sRGB color space 100 to form the color object 70…) **of the five processing stages** ([Fig. 3, (70a-70e)]).

Hiramatsu teaches of wherein a first (Fig. 4, S401 and S402) processing stage (Fig. 4, S401 and S402) comprises **commingling** (mixing) **of image channels** (L or A or B) ([0155] - *Referring to FIG. 10, first, specific color data is obtained in step S1001. Unlike the first embodiment, here, L*a*b* data of a white point, a black point, a blue point, a red point, and a green point of the input color space and L*a*b* data of a white point and a black point of the output color space are obtained…* [0156] - *The amount of movement of a color having lightness between the white point and the black point is calculated by interpolation according to each L-value when the correction processing of the white point is actually performed…*)**; multidimensional** (interpolation using more than one data set (e.g. Interpolation requiring at least 2 known data points to construct need data points within the range of the discrete set)) **interpolation that governs commingling** (mixing) **of image channels** ([0155] - *Referring to FIG. 10, first, specific color data is obtained in step S1001. Unlike the first embodiment, here, L*a*b* data of a white point, a black point, a blue point, a red point, and a green point of the input color space and L*a*b* data of a white point and a black point of the output color space are obtained…* [0156] - *The amount of movement of a color having lightness between the white point and the black point is calculated by interpolation according to each L-value when the correction processing of the white point is actually performed…*)**.** Hiramatsu has a second transformation step including a conversion (Fig. 4, (S407)), the second processing stage comprises **one dimensional** (conversion using one data set (e.g.

RGB > LAB)) **transforms** ([0084] - *in step S407, the obtained input image data is converted into image data represented in an absolute color space. This data represented in the RGB space is converted into data represented in a color space independent of the device (L*a*b* space, for instance) by a masking technique and the like*)**,** and **a the third processing stage** (Hiramatsu further teaches of wherein the third processing stage defines a chromatic adaptation in the chromatic adaptation color space according to the white point ([Fig. 4, (S409)] and [0085] - *Thereafter, in step S409, the color space compression processing on the absolute color space is performed…. Specifically, four conversion processes are performed including correction of a white point…*).)

Hiramatsu teaches of interpolation and the use of creating tables however fails to specifically connect the interpolation with a table. However considering Hiramatsu teaches that crating a table allows direct conversion from the input color space into the output color space a high speed ([0017] - *Specifically, the technique involves calculating the conversion parameter at a high speed, creating a **table** that allows direct conversion from the input color space into the output color space using the calculated conversion parameter, and performing the color conversion by utilizing this table…*) it would have been obvious to one of ordinary skill in the art at the time the invention to have created an interpolation table to assist in the processing and conversion using L*A*B values in the color space.

Fushiki, Hiramatsu, and Hauck teach the limitations of claim 10 above, however both Fushiki, Hiramatsu, and Hauck fail to specifically teach wherein a processing stage

comprises a matrix. Hordley teaches of a machine-implemented method ([0051] - *The colour signal to be processed may be obtained from a camera, a multispectral imaging device, or a scanner, or may be a computer generated RGB etc. signal.*) wherein a processing stage comprises **a matrix** ([0207] - *using the XYZ colour matching functions, plotted in FIG. 12, the XYZ response was calculated for the red, green, yellow, purple, white, blue and orange patches under the 10 Planckian illuminants. The best 3.times.3 matrix transform mapping XYZs to corresponding SONY RGBs was found. Finally the LCDs were calculated and rotated according to the rotation matrix derived…*).

Hordley also teaches that the gamut of possible image chromaticities depended on the illuminant color, that the illuminant color itself is quite limited, and that the chromaticities of real illuminants tend to be tightly clustered around the Planckian locus ([0004] - *The chromaticity constancy problem has proven to be much more tractable. In Color in perspective (IEEE Transactions, pages 1034 to 1038, October 1996), Finlayson made two important observations. First, was that the gamut of possible image chromaticities depended on the illuminant colour (this result follows from previous work on 3-dimensional RGB gamuts) and second, that the illuminant colour was itself quite limited. The chromaticities of real illuminants tend to be tightly clustered around the Planckian locus.*) Furthermore Hordley teaches that the illumination is specifically calculated by a rotation matrix ([0122] - *Log chromaticity differences (LCDs) for 7 surfaces (green, yellow, white, blue, purple, orange and red) under 10 Planckian lights… are calculated and rotated according to the SONY rotation matrix…*). Considering the colors that are perceived depend almost exclusively on surface

reflectance, and illumination is strongly depended upon, Hordley teaches of the benefit of the rotation matrix to remove the dependency due to illuminant color through color constancy computation ([0002]).

All of the elements of claim 10, are known in Fushiki, Hiramatsu, and Hauck in view of Hordley, the only difference is the combination of know elements into a single system and method.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to include in Fushiki, Hiramatsu, and Hauck the image color correction by use of matrix calculations taught by Hordley, as the benefits of removing the dependence due to illuminant color would improve the gamut of possible image chromaticities, therefore enhancing image production and consistency in color within color signal processing (Hordley - [00002], [0004], [0122], and [0186]).

27. Regarding claim 14, the rationale disclosed in the rejection of claim 10 is incorporated herein.

28. Regarding claims 22, 28, and 32, they are similar in scope to claims 4, 10, and 14 respectively. Said claims are different only in that they disclose a storage device machine readable medium. Fushiki teaches of a storage device machine readable medium within [Column 3, lines 32-51] (as further disclosed in the rationale provided in claim 19 above).

Therefore, claims 22, 28, and 32 are rejected under the same rational as claims 4, 10, and 14 and in further view of the rationale provided by Fushiki [Column 3 lines 32-51] as claim 19 above.

Allowable Subject Matter

29. Claims 37-41 are allowed.

30. Claims 11, 12, 15, 16, 29, 30, 33, and 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

31. The following is a statement of reasons for the indication of allowable subject matter:

32. All of the prior art (Fushiki, Hiramatsu, Hauck, and Hordley) singly or in combination fail to teach or suggest the implementation of **a first stage of making entries of the multidimensional interpolation table positive, and normalizing the entries in the multidimensional interpolation table; a second processing stage that denormalizes output of the first stage, applying a nonlinear function, and scales by a scaling factor; and a third processing stage that denormalizes output of the second processing stage, and performs the chromatic adaptation** as recited in claims 11 and 29.

As a result, the limitations of claims 11 and 29 are objected to, but would be allowable if rewritten in independent form including all of the limitations of the base claim wherein also including any intervening claims.

33. Regarding claims 12 and 30, they depend upon claims 11 and 29 which are objected to but would be allowable if rewritten in independent form including all of the limitations of the base claim wherein also including any intervening claims. Therefore claims 12 and 30 would also be allowable as they depend upon potentially allowable subject matter.

34. Furthermore, all of the prior art Fushiki, Hiramatsu, Hauck, and Hordley) singly or in combination fail to teach or suggest the implementation of a first processing stage that performs a **negating a channel of the image color space, and swapping rows in the multidimensional interpolation table having a 1 in the channel with rows in the multidimensional interpolation table having a 0 in the channel; generating a second processing stage that applies a nonlinear function, and applies the offset; and generating a third processing stage that denormalizes output of the second processing stage, and performs the chromatic adaptation** as recited in claims 15 and 33.

As a result, the limitations of claims 15 and 33 are objected to, but would be allowable if rewritten in independent form including all of the limitations of the base claim wherein also including any intervening claims.

35. Regarding claims 16 and 34, they depend upon claims 15 and 33 which are objected to but would be allowable if rewritten in independent form including all of the limitations of the base claim wherein also including any intervening claims. Therefore claims 16 and 34 would also be allowable as they depend upon potentially allowable subject matter.

36. Regarding claim 37, the rationale for allowance is similar to that provided for claims 11 and 29 (claims 11 and 29 being still objected for depending from independent claims that are not in condition for allowance). Claims 38-41 are allowable for being dependent upon independent claim 37.

Response to Arguments

37. Applicant's arguments filed 10/09/2008 have been fully considered but they are not persuasive.

Applicant's arguments recite (remarks page 18) that Fushiki does not show "a multistage transform capable of translating a first color space to a second color space."

The examiner respectfully disagrees. A <u>transform</u> according to one skilled in the art would be a transformation function which by definition of IEEE is "a mapping function that performs graphical coordinate transformation such as scaling, rotation, and

translation." Since the input data is raw data that has been converted into the perceptual based color space and then transformed to the physical color space it is explicitly taught by Fushiki of a multistage transform capable of translating a first color space to a second color space.

38. Applicant's arguments recite (remarks page 18) that Fushiki does not disclose or suggest generating a color profile. Applicant's arguments in this regard have been considered but are moot in view of the new ground(s) of rejection.

39. Applicant's arguments with respect to claims directed to "affecting" the operations "during the generating" of the color profile (Remarks, page 19, regarding claim 1 in view of Fushiki) have been considered but are moot in view of the new ground(s) of rejection with respect to the generation of the color profile.

40. Applicant's argues that Hiramatsu does not cure the deficiencies of Fushiki, with regard to "generating a color profile that defines a multistage transform capable of translating a first color space to a second color space, where the generating the color profile comprises affecting two stages of the multistage transform based on the image parameters during the generating of the color profile, as recited in claim 1".

The examiner respectfully notes that only "affecting the image with use of parameters" was being cited as taught by Hiramatsu, therefore the arguments are moot for all counts except for said limitation. The examiner respectfully disagrees that

Hiramatsu does not teach affecting an image by use of parameters; it is expressly taught in [0082] and [0083] that conversion parameters are directly affected based on white and black point data which obviously affects color images.

41. Applicant's arguments further include accusations that the office action fails to provide proper rationale to combine the references. The examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, motivation has been found because there are clear advantages that those of ordinary skill in the art are already familiar with. The motivation provided by combining remains evident as pointed out in the office action. Regardless the applicants stand point the examiner respectfully notes that both Hiramatsu and Fushiki are both directed to the same subject matter in that color spaces and color manipulation techniques are present in both. Considering that all of the limitations are common to those skilled in the art, motivation to combine features of Hiramatsu in Fushiki would be obvious because providing computations faster, better, or to even reduce bandwidth within a system provides obvious advantages that WOULD motivate one skilled in the art to combine technologies.

42. Applicant's arguments (remarks, page 22) recite in part: “Fushiki and Hiramatsu--whether taken alone or in any combination fail to teach or suggest at least affecting two or more processing stage definitions of a transform defining element in a color profile during creation of the color profile, as recited in claims 42 and 44.”

The examiner respectfully disagrees. First, as stated above, Fushiki is obviously affecting at least two processing stages as the input data is raw data that has been converted into the perceptual based color space and then transformed to the physical color space it is explicitly taught by Fushiki of a multistage transform capable of translating a first color space to a second color space. Regarding creating a color profile, the arguments are moot in view of new ground(s) of rejection.

43. Applicant's argues that Fushiki does not disclose or suggest “taking image parameters into account across two or more processing stages…”. The examiner respectfully disagrees. Image parameters were taught in Hiramatsu and were not cited as being taught by Fushiki therefore applicants arguments are moot.

44. Applicant's arguments for claim 46 are similar to those of the arguments for claim 1. Please see the response for claim 1 as it is incorporated herein.

45. Applicants arguments regarding claims 4, 10, and 14 have no substance and do not have supporting rationale as to why one of obvious skill would fail to associate the

prior art as record. Since there are no supporting arguments present there can be no proper response.

46. Applicants arguments regard claims 4 and 22 assert that the prior art of record fails to teach “bit-depth independent color profile". The examiner respectfully disagrees. Images inherently are constructed in according to a number of bits, such as 24-bit is true color as provided by most Windows programs provided by Microsoft. Color depth is taught specifically by Hordley. Since colors in an image are inherently comprised of a bit ratio for image quality the fact that Hordley specifically has a color depth is equivalent to having a bit depth within color. Furthermore a profile is defined as any color scheme, warm color temperature is one such profile known to those skilled in the art. Therefore considering the color temperature may vary in depth of color (bits) without changing the nature of the color, the temperature profile is independent because one does not have to change in order to change the other.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AARON M. GUERTIN whose telephone number is (571)270-1547. The examiner can normally be reached on M-F 8:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Xiao Wu can be reached on 571-272-7761. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Aaron M Guertin/
Examiner, Art Unit 2628

/XIAO M. WU/
Supervisory Patent Examiner, Art Unit 2628